



5.4.6 HAZARDOUS MATERIALS

This section provides a profile and vulnerability assessment of the hazardous materials hazard for Monroe County.

5.4.6.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections and the probability of future occurrences for the hazardous materials (HazMat) hazard.

Hazard Description

HazMat are substances considered severely harmful to human health and the environment, as defined by the United States Environmental Protection Agency (US EPA) Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (Superfund Law). This law created a tax on the chemical and petroleum industries and provided federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment (U.S. EPA 2022). There are about 800 CERCLA hazardous materials. Additionally, there are approximately 1,500 known radionuclides, approximately 760 of which are listed individually (U.S. EPA 2022).

Hazardous substance as defined by section 101(14) of CERCLA includes the following:

- Any substance designated pursuant to section 311(b)(2)(A) of the Federal Water Pollution Control Act (33 U.S.C 1215 et seq.) (U.S. EPA 2022);
- Any element, compound, mixture, solution, or substance designated as hazardous under section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA);
- Any hazardous waste having the characteristics identified under or listed pursuant to section 3001 of the Solid Waste Disposal Act (42 U.S.C. 6801 et seq.) (but not including any waste the regulations of which under the Solid Waste Disposal Act has been suspended by Act of Congress) (U.S. EPA 2022).
- Any toxic pollutant listed under section 307(a) of the Federal Water Pollution Control Act (U.S. EPA 2022);
- Any hazardous air pollutant listed under section 112 of the Clean Air Act ([42 U.S.C. 7401 et seq.](#)); and
- Any imminently hazardous chemical substance or mixture with respect to which the Administrator of EPA (Administrator) has taken action pursuant to section 7 of the Toxic Substances Control Act ([15 U.S.C. 2601 et seq.](#)). The term does not include petroleum, including crude oil or any fraction thereof which is not otherwise specifically listed or designated as a hazardous substance under paragraphs (1) through (6) of this definition, and the term does not include natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas) (U.S. EPA 2022).

Numerous facilities throughout Monroe County use and store HazMat as defined by US EPA. Many products containing HazMat are used and stored in homes, and these products are shipped daily on highways, railroads, waterways, and pipelines. If released or misused, HazMat can cause death, serious injury, long-lasting health effects, and damage to structures and other properties, as well as to the environment.

Transportation of HazMat on highways involves tanker trucks or trailers, which are responsible for the greatest number of hazardous substance release incidents. The Monroe County Department of Transportation is responsible for approximately 1,500 lane miles of county-owned highways, 180 bridges, and 275 major culverts (Monroe County 2022). These roads cross rivers and streams at many points; hazardous substance spills on roads



could pollute watersheds that serve as domestic water supplies for areas within Monroe County and other parts of the State. Hazardous substance releases also could occur along rail lines, as collisions and derailments of train cars can result in large spills.

Pipelines transport hazardous liquids and flammable substances such as natural gas and petroleum. If these pipes are corroded, hazardous substances releases could occur when the pipes are damaged during excavation, incorrect operation, or by other forces. When HazMat are transported by aircraft or by watercraft, crashes, spills of materials, or fires on these vessels can pose hazards.

Nuclear power generating stations, research reactors, or other stationary sources of radioactivity present the threat of release of radiological material. This type of event could threaten a large, multi-jurisdictional area, and result in property damage, contamination of farm and water supplies, and economic damage.

Location

The following information pertains to locations of hazardous substances incidents.

Hazardous Materials Fixed Site

A fixed-site hazardous substance (materials and waste) incident is the uncontrolled release of materials from a fixed site, capable of posing a risk to health, safety, and property as determined by the Resource Conservation Recovery Act (RCRA). It is possible to identify and prepare for a fixed-site incident because federal and state laws require those facilities to notify state and local authorities about the materials being used or produced at the site. Hazardous materials at fixed sites are regulated by the EPA.

The EPA chooses to specifically list substances as hazardous and extremely hazardous, rather than providing objective definitions. Hazardous substances (as listed) are generally materials that, if released into the environment, tend to persist for long periods and pose long-term health hazards for living organisms. Extremely hazardous substances, while also generally toxic materials, represent acute health hazards that, when released, are immediately dangerous to the lives of humans and animals and cause serious damage to the environment. When facilities contain these materials in quantities at or above the threshold planning quantity (TPQ), they must submit “Tier II” information to appropriate state and/or local agencies to facilitate emergency planning.

More than 300 fixed facilities use or store HazMat in Monroe County. For security purposes, they are not mapped in this profile.

Superfund is a program administered by the US EPA to locate, investigate, and clean up the worst hazardous waste sites throughout the United States. Data from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database indicates that no Superfund sites are present in Monroe County (U.S. EPA 2022).

Hazard Materials In-Transit

As defined in regulations by the U.S. Department of Transportation (DOT) Materials Transport, a hazardous materials transportation incident is any event resulting in an uncontrolled release of materials during transport that can pose a risk to health, safety, and property. Transportation incidents are difficult to prepare for because there is little, if any, notice about the types of materials involved should an accident happen.

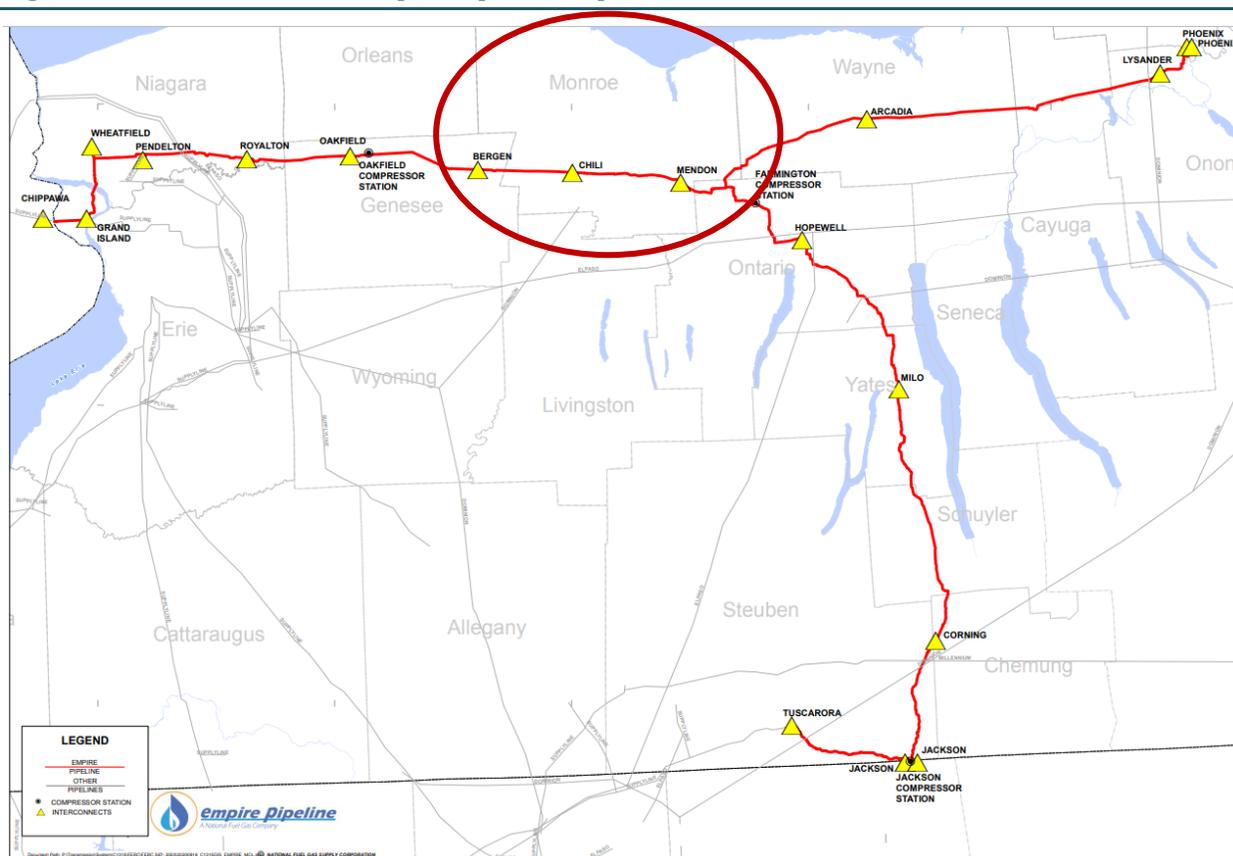
Hazardous materials transportation incidents can occur anywhere within the United States. Transportation of hazardous materials on highways involves tanker trucks or trailers, and these are responsible for the greatest number of hazardous substance release incidents. Potential also exists for hazardous substance releases to occur



carrying HazMat are of concern because an accident or release could pose a public safety hazard to the community.

HazMat can also be transported via underground petroleum and gas (natural and propane) pipelines across the State. New York has an extensive network of natural gas and petroleum pipelines, at least one of which passes through Monroe County. Figure 5.4.6-2 shows extent and location of pipelines throughout western New York state and Pennsylvania, with Monroe County’s general area indicated by the red oval.

Figure 5.4.6-2. National Fuel Empire Pipeline Map



Source: National Fuel Gas Company 2020

Note: The red oval represents the approximate location of Monroe County

Radiological

The threat of a radiological event at a fixed facility is always a possibility because of proximity of the Ginna Nuclear Power Station in Wayne County to the northeastern border of Monroe County. For commercial reactors, areas of risk from exposure to radiation releases are designated as (1) within the Plume Exposure Emergency Planning Zone (EPZ) of such sites (within a 10-mile radius of a site) for direct exposure, or (2) within the Ingestion Pathway Emergency Planning Zone (within a 50-mile radius of a nuclear site) for exposure via the food chain. A credible worst-case event of a radioactive release from a fixed site could affect a large region around the nuclear power site.

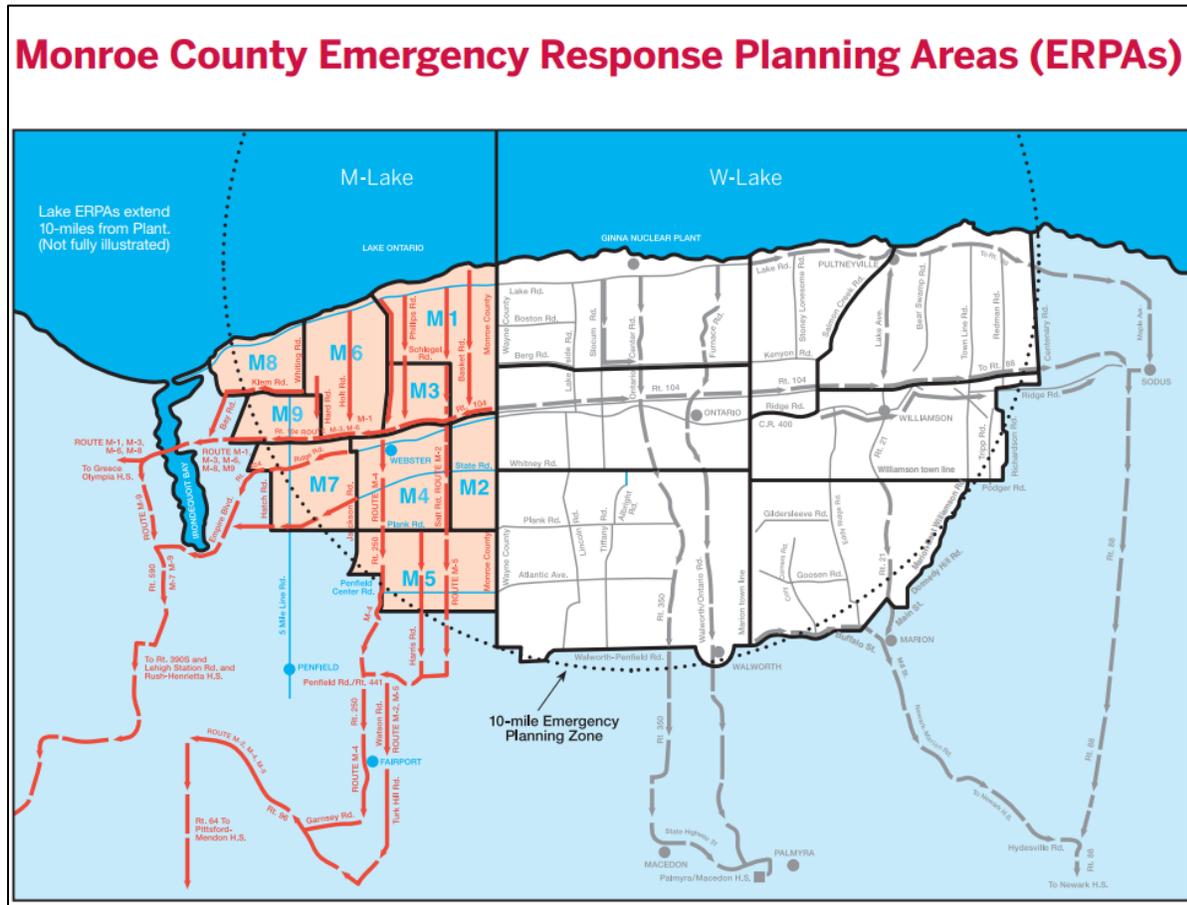
The federal EPZ and its 10-mile radius overlay portions of the towns of Webster and Penfield, and the Village of Webster. The 10-mile EPZ is sectorized into Emergency Response Planning Areas (ERPA) for Emergency Management purposes. In coordination with New York State, and as tested by the Federal Emergency Management Agency (FEMA), Monroe and Wayne County plans address public alerting and notification,



emergency response, special need populations, evacuation routes, detection and monitoring, decontamination, and public health among other topics. The Monroe County Radiological Emergency Preparedness Plan and community Public Safety providers are annually tested on their readiness and response (Constellation Energy Corporation 2022).

Substantial safety features and security measures are in place at the Ginna Nuclear Power Station. Figure 5.4.6-3 below displays the Monroe County Emergency Response Planning Areas (ERPAs).

Figure 5.4.6-3. Monroe County Emergency Response Planning Areas (ERPAs)



Source: Constellation Energy Corporation 2022

Extent

The extent of a hazardous substance release depends on (1) whether the substance is released from a fixed or mobile source, (2) the size of the impacted area, (3) the toxicity and properties of the substance, (4) the duration of the release, and (5) environmental conditions (for example, wind and precipitation, terrain, etc.).

Hazardous substance releases can contaminate air, water, and soils, possibly resulting in death and/or injuries. Dispersion can occur rapidly when the hazardous substance is transported by water and wind. While often accidental, releases can occur because of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. HazMat can include toxic chemicals, radioactive substances, infectious substances, and hazardous wastes. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas.





Severity or impact of a hazardous substance release, whether accidental or intentional, depends on several potentially mitigating or exacerbating circumstances. Mitigation involves precautionary measures taken in advance to reduce the impact of a release on the surrounding environment. For example, primary and secondary containment or shielding by implementation of sheltering-in-place protects people and property from the harmful effects of a hazardous substance release. Exacerbating conditions, characteristics that can enhance or magnify the effects of a hazardous substance release, include the following:

- Weather conditions, which affect how the hazard occurs and develops
- Micro-meteorological effects of buildings and terrain, which alter dispersion of HazMat in compliance with applicable codes (such as building or fire codes)
- Maintenance failures (such as fire protection and containment features), which can substantially increase damage to a facility and to surrounding buildings.

The severity of an incident depends not only on the circumstances described above, but also on the type of substance released and the distance from the incident and related response time of emergency response teams. Areas closest to a release are generally at greatest risk; however, depending on the substance, a release can travel great distances or remain present in the environment for a long period of time (for example, centuries to millennia).

According to the 2022 Monroe County HazMat Response Plan, there are four main classifications of HazMat incidents:

- “Level 0” incident is not likely to adversely impact or threaten life, health, property, or the environment; control of the incident is within the capabilities of resources available to the local response jurisdictions.
- “Level 1” incident may adversely impact or threaten life, health, property or the environment within an area immediately surrounding the point of release or potential release; control of the incident is within the capabilities of the resources locally available to responders in Monroe County.
- “Level 2” incident may adversely impact or threaten life, health, property or the environment beyond the point of release; incident may be across municipal jurisdictions; control of the incident is within the capabilities of the resources based within Monroe County.
- “Level 3” incident is likely to adversely impact or threaten life, health, property, or the environment in a large geographic area. Additional resources are required to supplement those available within Monroe County (Office of Emergency Management 2022).

The occurrence of a hazardous materials incident can be sudden and without any warning, such as an explosion, or may slowly develop, as in the case of a leaking container for example. Facilities that store extremely hazardous substances are required to notify local officials when an incident occurs. Local emergency responders and emergency management officials would determine whether they need to evacuate the public or to advise to shelter in place. Similar to on-site hazardous substances incidents, the amount of warning time for incidents associated with hazardous substances in transit varies based on the nature and scope of the incident. If an explosion did not occur immediately following an accident, officials may have time to warn adjacent neighborhoods and facilitate appropriate protective actions.

The north-central region of Monroe County is closest to the Ginna facility, and some areas fall within the prescribed 10-mile EPZ or evacuation area. Additionally, all Monroe County jurisdictions are within the 50-mile ingestion exposure pathway, and could receive deposits of radioactive particles on crops, bodies of water, and ground surfaces, rendering local agricultural harvest unusable for consumption by either humans or livestock.



Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with hazardous material releases throughout New York State and Monroe County; therefore, the loss and impact information for many events varies depending on the source. The accuracy of monetary figures discussed is based on the available information in cited sources.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, New York State was included in two FEMA declared hazardous material specific emergency declarations (EM). Typically, EMs cover a wide region of an included state, and therefore could impact many counties within that state. However, not all counties in New York State were included in the two EMs cited above. Importantly, Monroe County was not included in either EM.

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was not included in any USDA-designated agricultural disasters that included hazardous materials events.

Previous Events

Table 5.4.6-1 identifies the known hazardous materials events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix H (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).



Table 5.4.6-1. Hazardous Material Releases in Monroe County, 2015 to 2022

Dates of Event	Event Type	FEMA Declaration Number	Monroe County Designated?	Location	Losses / Impacts
April 10, 2015	Chemical	N/A	N/A	Town of Henrietta	A combination of cleaning chemicals produced an odor and fog resulting in a HazMat situation at the Henrietta Holiday Inn.
July 24, 2016	Chemical	N/A	N/A	Village of East Rochester	Police responded to a Level 1 HazMat situation in the Village of East Rochester.
August 13, 2016	Fuel/Oil/Gas	N/A	N/A	City of Rochester	A gasoline leak from a vehicle in a lower-level maintenance shop was found causes the evacuation at Senior Home in the City of Rochester.
March 5, 2017	Fuel/Oil/Gas	N/A	N/A	City of Rochester	A car crashes into building in Culver Road and Norton Street area in the City of Rochester, resulting in the disconnection of a gas main that feeds into the building.
July 7, 2017	Fuel/Oil/Gas	N/A	N/A	Town of Perinton	A natural gas operated garbage truck was stuck underneath the Baird Road Bridge in the Town of Perinton. When the truck hit the bridge, it crushed the gas tanks, and caused the natural gas to leak.
September 26, 2017	Chemical	N/A	N/A	City of Rochester	Five gallons of an unknown chemical were poured down the drain of an unoccupied building at Emerson Street in the City of Rochester.
November 1, 2017	Fuel/Oil/Gas	N/A	N/A	Town of Perinton	A wrong-way driver caused a crash that closed I-490 overnight in the Town of Perinton. The crash resulted in thirty to forty gallons of gasoline to leak onto the I-490, deeming a Level 0 HazMat situation.
February 28, 2018	Fuel/Oil/Gas	N/A	N/A	Town of Chili	During construction a gas line was punctured, resulting in a gas leak and a closure of the adjacent plaza in the Town of Chili.
March 13, 2018	Fuel/Oil/Gas	N/A	N/A	City of Rochester	A tractor-trailer crash resulted in downed powerlines in the City of Rochester. The tractor-trailer began leaking diesel fuel in the roadway and firefighters need to apply suppression to the diesel fumes to clear crash site.
June 11, 2018	Fuel/Oil/Gas	N/A	N/A	Town of Wheatland	A collision occurred between a fuel tanker carrying 1,000 gallons of gas and 800 gallons of diesel fuel collided with a van in the Town of Wheatland. HazMat crews responded to the crash for necessary precautions.
December 12, 2018	Chemical	N/A	N/A	City of Rochester	A leak of chlorine gas outside a City of Rochester chemical plant sparked a fire and hazmat response.
August 29, 2019	Chemical	N/A	N/A	City of Rochester	A resident of a high rise building on Van Auker Street in the City of Rochester microwaved a hot pepper causing other residents trouble breathing. The hot pepper released the chemical capsaicin as a result of being microwaved.
May 3, 2020	Fuel/Oil/Gas	N/A	N/A	City of Rochester	Several buildings on East Main Street in the City of Rochester had to be evacuated due to a gas leak.

Source: NOAA-NCEI 2022; FEMA 2022; Global Incident Map 2022





Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to increase. The impacts related to increasing temperatures and sea level rise are already causing complications in the state. *ClimAID: The Integrated Assessment for Effective Climate Change in New York State (ClimAID)* was undertaken to provide decision-makers with information on the state’s vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (NYSERDA 2011/2014).

Temperatures in New York State are warming, with an average rate of warming over the past century of 0.25° F per decade. Average annual temperatures are projected to increase across New York State by 2–3.4 °F by the 2020s, 4.1–6.8 °F by the 2050s, and 5.3–10.1 °F by the 2080s. By the end of the century, the greatest warming is projected to be in the northern section of the state (NYSERDA 2011/2014).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1 (Western New York and the Great Lake Plains), where temperatures are estimated to increase by 4.3 to 6.3°F by the 2050s and 5.7 to 9.6°F by the 2080s (baseline of 47.7°F, middle range projection). Precipitation totals are estimated to increase between four to ten percent by the 2050s and four to thirteen percent by the 2080s (baseline of 34.0 inches, middle range projection). Table 5.4.6-2. displays the projected seasonal precipitation change for the region (NYSERDA 2011/2014).

Table 5.4.6-2. Projected Seasonal Precipitation Change in Region 1, 2050s (% change)

Winter	Spring	Summer	Fall
+5 to +15	0 to +15	-10 to +10	-5 to +10

Source: NYSERDA 2014

Non-natural incidents such as hazardous substance incidents are not typically considered vulnerable to climate change; however, climate change may have some impact. Climate change and its impact on hazardous materials sites, particularly waste sites, is a growing concern. According to the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI) State Climate Summaries for New York State, the mean annual temperature has increased approximately 2 °F. This temperature change is likely to indirectly affect the County’s vulnerability to hazmat incidents.

As temperatures change, excessive heat on aging structures and/or infrastructure may be adversely affected. Excessive heat on structures or containers containing hazardous materials may alter the material properties.

In addition, hazardous substances stored at fixed locations in the floodplain may experience an increase in flood events due to the projected changes in increased precipitation events, specifically related to magnitude and frequency. Hazardous waste sites near rivers are tentatively at highest risk because extreme storms and higher water levels could release pollution into the environment. Many of these sites were built in locations believed to be removed from potential contamination or exposure-increasing factors. However, development, floodplain boundary change, and an increase in extreme events from climate change are increasing the possibility that water may reach hazardous material and waste sites.

Probability of Future Occurrences

Predicting future hazardous substance incidents in Monroe County is difficult. These can occur at anytime and anywhere in the County. Incidents can occur suddenly without any warning or develop slowly. Small spills, both fixed site and in transit, occur throughout the year, and probability of occurrences of these events is high. Risk of a major incident within a given year is small.



In Section 5.3, the identified hazards of concern within Monroe County were ranked. Probability of occurrence, or likelihood of an event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, probability of occurrence of HazMat spills within the County is considered “rare” (Between 1 and 10 percent annual probability of a hazard event occurring., as presented in Table 5.3-1).

The County is expected to continue to undergo direct and indirect impacts of hazardous substance incidents annually that may induce secondary hazards such as infrastructure deterioration or failure, potential decreases in water quality and supply, and transportation delays, accidents, and inconveniences.

5.4.6.2 Vulnerability Assessment

A qualitative assessment was conducted for hazardous material incidents in Monroe County. The following discusses the County’s vulnerability to this hazard. Refer to Section 5.1 (Methodology and Tools) for additional details on the methodology used to assess the hazardous materials risk.

Impact on Life, Health and Safety

Hazardous material incidents have the potential to compromise the health and safety of those living and working in the area of the incident. Specific impacts vary according to the type of material released, the area affected, and the population within the affected area.

A chemical incident may also include an explosion, with additional injuries and deaths being caused by the pressure wave from the explosion. Biological incidents effects on the population depend on the nature of the agent involved, transmissibility, at-risk populations, incubation period, time before detection, and other factors. Biological agents may cause disease from which some individuals will recover while others will not. Radioactive materials can cause significant health effects in individuals, especially if the materials are taken into the body. Radiological incidents that result in the release of radioactive materials from a nuclear power plant can contaminate sources of potable water, livestock, and crops, leading to a dramatically reduced local food supply. Large chemical incidents, and radiological incidents that result in the release of radioactive materials can contaminate sources of potable water, crops, and livestock, leading to a reduced local food supply.

Depending on the type and quantity of chemicals released and weather conditions, an incident can affect larger areas that cross jurisdictional boundaries. When HazMat are released into the air or water, or on land, they may contaminate the environment and pose greater danger to human health. The general population may be exposed to a HazMat release through inhalation, ingestion, or dermal exposure. Exposure may be either acute or chronic, depending upon the nature of the substance and extent of release and contamination. HazMat incidents can lead to injury, illnesses, and/or death of involved persons and those living within the impacted areas.

Locations of these different HazMat and wastes sites in Monroe County render the entire County vulnerable to these hazards. Populations particularly vulnerable to effects of HazMat incidents are along major transportation routes, because significant quantities of chemicals are transported along these major thoroughfares.

Impact on General Building Stock

Potential losses of general building stock caused by a HazMat incident are difficult to quantify. Extent of damage to the general building stock depends on the scale of the incident. Potential losses may include inaccessibility, loss of service, contamination, and/or potential structural and content losses if an explosion occurs.



Impact on Critical Facilities

Potential losses of critical facilities caused by a HazMat incident are difficult to quantify. Potential losses may include inaccessibility, loss of service, contamination, and/or potential structural and content losses if an explosion occurs. If the operators at a critical piece of infrastructure, such as a power plant, were unavailable, there could be physical damages to the infrastructure itself. Refer to Section 4 (County Profile), which summarizes the number and type of critical facilities in Monroe County.

Impact on Economy

If a significant HazMat incident occurs, not only would life, safety, and building stock be at risk, but the economy of Monroe County would be affected as well. A significant incident within an urban area may force businesses to close for an extended period of time because of contamination or direct damage caused by an explosion, if one occurred. Exact impacts on the economy are difficult to predict, given the uncertainty of sizes and scopes of incidents.

HazMat incidents can lead to closures of major transportation routes in Monroe County. Closures of waterways, railroads, airports, and highways because of these incidents can hinder delivery of goods and services. Potential impacts may be local, regional, or statewide, depending on the magnitude of the event and the extent of disruptions to services.

Radiological contamination of agriculture, livestock, and production can lead to loss of commerce with other regions of the State, country, and even the world. Certain chemicals and hazardous materials can be toxic to plants and animals, damaging their habitats and food sources. Radioactive materials released into the environment could enter the food chain and ultimately contaminate the human food supply. Nuclear impacts on the environment are similar to that of radioactive materials; however, the extent of impacts can be larger due to the amount of miles it can impact (NYC 2019).

Impact on the Environment

Certain chemicals and hazardous materials can be toxic to plants and animals, damaging their habitats and food sources. Radioactive materials released into the environment could enter the food chain and ultimately contaminate the human food supply. Nuclear impacts on the environment are similar to that of radioactive materials; however, the extent of impacts can be larger due to the amount of miles it can impact (NYC 2019).

Wastes that get into waterways will be disruptive and sometimes deadly to aquatic species. Consequentially, wastes that get into waterways can also contaminate drinking water supplies. Hazardous wastes can also leach into soils and travel with wind, which not only impacts the local habitat, but can create issues for surrounding communities. Strict disposal regulations have been defined by organizations like EPA to ensure that the environment and community is protected from these types of events.

Cascading Impacts On Other Hazards

Hazardous material incidents can cause utility failure. If an explosion or contamination occurred, water quality and supply could stop or drastically decrease.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the County can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The County considered the following factors to examine potential conditions that may affect hazard vulnerability:



- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Any areas of growth could be potentially impacted by the hazardous materials hazard. Development near the transit routes for hazardous materials and facilities will increase the County’s overall risk. Therefore, the County should take precautions when determining the location of new development to consider the development’s proximity to hazardous material facilities and transit routes. The County may also want to consider implementing designs into the new development that enable improved evacuation or protection from residual impacts from the hazardous materials. Section 4, County Profile, includes more information about the county’s anticipated and recent new development plans.

Specific areas of recent and new development are indicated in tabular form and/or on the hazard maps included in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

Projected Changes in Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County’s population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Any changes in the density of population can impact the number of persons living near hazardous materials facilities, transit routes, and pipelines. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

Climate Change

As temperatures change, excessive heat on hazardous materials containers may alter the properties of the material. In addition, fixed hazmat storage locations in the floodplain may experience an increase in flood events due to the projected changes in increased precipitation events, such as changes in magnitude and frequency.

Change of Vulnerability Since 2017 HMP

This vulnerability assessment uses updated data where applicable to provide a better understanding of the potential impacts caused by hazardous materials.